# 28 July 2002 Mission Report

**Forecast:**

The forecast was unfavorable for maritime convection, so the planes stood up for flights over the peninsula, expecting suppressed conditions due to low moisture ahead of an approaching easterly wave. We expected late-afternoon convection on the west coast. Additionally, forecasts with the NAAPS model called for Saharan dust near Florida.

**Mission Summary:**

The Proteus stood down because of engine problems. The WB-57F and ER-2 flew off the east coast of Florida for an Aqua satellite overpass. The Citation and Twin Otter sampled aerosols over the peninsula. Late-afternoon convection was generated near Lake Okeechobee around 1900Z, and was over the west coast around 2030Z.

**Aircraft Summaries:**

***Citation***

The Citation took off around 1938Z and headed for the western ground site. They targeted a few convective clouds early in the flight while flying at an altitude of 29 kft. The first cloud was sampled at levels of 29, 31, and 33 kft. A second cloud was sampled at 29 and 31 kft, where the top of the cloud was about 31 kft. N-POL directed the Citation to fly some legs near the western ground site, looking at anvils with tops at about 31 kft. They were diverted over the Gulf by ATC at this point, and hit a very thin cirrus layer that seemed to be dying away. They had a lot of difficulty getting clearances from ATC, so the Citation headed back to base at 2142Z. During the return flight, they penetrated a dust layer that topped out at about 16 kft. At the top of the dust layer, the CFDC instrument was getting very high ice nuclei counts (~1000/liter). The Citation landed at 2207Z.

***ER-2***

The ER-2 took off around 1730Z, flew east of Florida, and aligned north-south across the Bahamas for the Aqua overpass. The track along the satellite overpass was mostly clear of clouds during this time. Six dropsondes were launched along this track. The ER-2 then lined up for some legs between the ground sites, and then was directed to fly north of the western ground site, over roughly the same horizontal legs the WB-57F was flying. The ER-2 returned to base around 0000Z.

***P-3***

The P-3 took off about 1830Z and flew some NE-SW legs north of the western ground site (in the Ft. Myers area). They later flew some legs oriented NW-SE just off the west coast in the Ft. Myers area. Some aircraft issues brought them back to base around 2200Z.

***Twin Otter***

The Twin Otter took off at 1831Z. They headed north from Boca Chica at an altitude of about 5 kft. They sampled two convective systems at the altitude of cloud base (between about 3 and 3.5 kft). The first cloud system was offshore of the west coast, and was sampled for about 80 minutes. The second cloud system was onshore, and was sampled for about 50 minutes. There were very high CCN and CN concentrations measured in association with each of these cloud systems, with sharp gradients noted in the concentrations as the plane circled the cloud and maximum concentrations noted on the upwind sides of the clouds. One of the cloud systems was actually underflown at one point, with no noticeable CN or CCN enhancements relative to background conditions. The AMS probe also saw some of the highest concentrations of sulfates and organics found on the mission. The Twin Otter returned to base at 2234Z.

***WB-57F***

The WB-57F took off about 1830Z. They climbed out to the east of Florida, getting to an altitude of 57 kft for an Aqua overpass. They then aligned for a couple of legs between the eastern and western ground sites, flying at 57.2, 51, and 45 kft. On the last leg, they were redirected to sample some cirrus blow-off north of the western ground site. They maintained these new legs for five or six runs at 45 kft, sampling the anvil from the tips right up to the center of convective cells. Near the end of these legs, they ascended to 51 kft at the western tip of the anvil (near an ER-2 dropsonde location) and then descended to 40 kft near the center of convection. The WB-57F returned to base around 2355Z.